

Analysis of the Digital Reference Services in Korean Public Libraries : A Longitudinal Study

우리나라 공공도서관의 디지털참고봉사에 대한 종단적 분석

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ABSTRACT

To understand the present status and the development of the digital reference service in Korean public libraries, a nationwide site observation was attempted in 2007. The collected data was analyzed, then compared with the previous analysis based on a 2003 data. For the 404 sites offering digital reference, operational characteristics, such as access level, service mode, link description, policy, web form, and FAQ, are analyzed. Performance analysis focused on the presence of question posting, volume of usage, response rate, and types of the questions, for the data collected for 15 days through question and answer transcript recording. Results reveal findings on the present situation as well as changes over 4 years. Related problems are identified. The conclusion includes suggestions for improving digital reference service.

초 록

공공도서관에서 제공하고 있는 디지털참고봉사의 현황과 발전을 이해하기 위하여, 전국의 공공도서관 홈페이지를 직접 접속하여 관찰하고 이용 데이터를 수집하여 분석하였으며, 2003년에 수집하였던 데이터와 비교하였다. 모두 404개의 디지털참고봉사 사이트에 대하여, 접근수준, 서비스방식, 링크명칭, 서비스정책, 웹폼, FAQ 등 서비스 제공 관련 특성을 분석한 후, 15일간 수행된 질문응답 데이터를 수집하여 이용도서관, 이용수준, 응답비율, 질문유형 등 서비스 성능을 분석하였다. 서비스 현황에 대한 이해와 문제점, 그리고 4년 동안에 걸친 변화가 식별되었으며, 향후 발전을 위한 제언이 이루어졌다.

Keywords : digital reference service, public libraries, offering characteristics, use analysis
디지털참고봉사, 공공도서관, 제공 현황, 이용 분석.

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■ Received : 25 May 2007

■ Accepted : 20 June 2007

1. Introduction

Library services has changed drastically over the past 10 years, due to internet which allows remote access by users to resources and librarians. Internet application to reference services, in particular, provide librarians with new ways of offering services, from in person to digital.

Digital reference service is an extension and development of traditional reference service in the web environment. It utilized the advantages of the internet to provide convenient, rapid, and efficient information services. With the application of web technology, the standard of the service advanced to a deeper and higher level. Digital reference allows librarians not only provide the users with directional or bibliographic information but provide them with source link or content directly. In addition, librarians conduct instruction effectively by showing the search strategies or paths, so that users can learn how

to search (Reference and User Services Association 2004).

In Korea, attention to the digital reference has begun in the middle of the 1990's. The news for service initiations often released since 2000. Of the small amount of research conducted, the majority focused on digital reference services in academic setting. There are a few attempts undertaken to understand the state of digital reference services in public libraries. One research examined electronic information services of the public libraries in Seoul metropolitan area through a survey (Kim, 2000), the other analyzed public library children's digital reference services in Seoul (Cho, 2003). In 2003, Chang (2004) attempted a nationwide examination to understand the status of the digital reference service offering and use in Korea. Lately, Lee(2006) examined digital reference services of 29 public libraries in Kyonggi province.

Korea, one of the countries establishing high standard of network infrastructure,

〈Table 1〉 Growth of major IT use indicators 2003–2006

(unit: 1,000)

IT indicators	2003 number (%)	2004 number (%)	2005 number (%)	2006 number (%)	2003–2006
vBNS subscribers	1,178 (23.40)	11,921 (24.90)	12,191 (25.40)	14,043 (29.08)	5.68% ↑
Internet users	29,220 (65.48)	31,580 (70.23)	33,010 (72.82)	34,120 (74.80)	9.32% ↑
Personal computers / 100 persons	50.68	51.70	53.36	55.88	5.20 ↑
Cell Phone subscribers / 100 persons	70.10	76.00	79.40	83.23	3.13 ↑

(source: Korea, Ministry of Communication 2007)

continues her progress. The great advances in the internet and information technology manifested internationally. In reference to the National Informatization Index, Korea jumped from rank twelfth (score 80) to rank third (score 91) in the world over the years 2003–2006. Besides, Korea is holding rank first in the ITU Digital Opportunity Index since 2005.

〈Table 1〉 demonstrates the extent of continuous increase in major information technology use indicators for the years 2003 – 2006.

From 2003 to 2007, all the above four indicators increased substantially. Internet usage rate of 74.8% means three in four residents are using internet. And the very high speed network service is the main communication method to internet for Korean netizens. To be more specific, most students (99.4%), professional managers (98.8%) and administrative workers (97.7%) use internet for their work and studies. People use the internet on average of 13.7 hours per week, and they use it for data/information (87.6%), communication (83.8%), and leisure(83.4%) (Korea, Ministry of Communication 2007).

Demographics indicate a growing potential users of digital reference services. Korean society seems to be furnished with the conditions requisite for the development of digital reference services. This study is based on the assumption that the advancement of the internet environment may cause the promotion of the digital reference services.

The purpose of this study is to understand

the present status and to examine the development of the public library digital reference services over 4 years of period from 2003 to 2007. It takes a longitudinal approach to identify the changes. The results of a previous study (Chang 2004) is utilized in comparison. Data analysis is descriptive in nature. Because little research in this approach as yet been conducted, it will contribute to better understanding the status of the digital reference services and provide insights into the development of library services in Korea.

2. Research Method

For the study, 2 phase of data collection was performed. The data was collected for 7 days from May 4, 2007 to May 10, 2007 through direct site observation and recording the transcripts.

In phase one, the author visited each library web site and accessed its digital reference service to observe the operational characteristics. To identify the URLs of public libraries, “Public Libraries Statistics” (The National Library of Korea, 2007) was consulted. Of the 563 entries listed, 507(90.05%) specified the URL of the library. Observation was made to the elements, such as service offering, access level, link description, service mode, policy statement, web form, and FAQ features.

In phase two, to assess the performance of the digital reference services, author

accessed the questions and answers list of the available library sites, then copied and counted the number of the transactions. Then, measured usage level and response rate. For a closer examination, the exact text of the each question was reviewed and the content was analyzed. Question data was collected retrospectively to allow a sufficient time to answer to the point of the observation. Questions, submitted for 15 days from April 19, 2007 to May 3, 2007, are the object of the analysis. Although the usage samples are not large, approximately 4%(15/365days) of entire use, the data would give us insights into the services being offered.

The data collection method and procedure of present study is exactly same as those of the previous study conducted in 2003 (Chang, 2004). Data collection is unobtrusive in nature. In collecting data, no attempt was made to contact the libraries. Consequently, the author couldn't access to the service, either the site is on repair or authentication is required. For the collected data, basic descriptive statistic analysis was made, and presented in parallel with the previous 2003 data for comparison.

Digital reference is a new and emerging area for libraries which poses ongoing challenges in establishing standard professional practices. In reviewing the literature, the author found the majority of them focused on the digital reference services by academic libraries even in the United States. The following are key examples of both descriptive and

reference assessment studies focused on public libraries. Janes (2001) and Mon & Janes (2003) explored the adaptation of digital reference as a service innovation. Lankes (1999) and Carter & Janes (2000) performed descriptive studies including log analysis and unobtrusive observation. Janes, Hill & Rolfe (2001), White et al. (2003), Nilsen (2004) made assessment studies examining the question-answering process and results.

3. Results

3.1 Operational Characteristics

3.1.1 Number of the Libraries Offering Digital Reference

Among the 563 public libraries listed in the "Public Library Statistics," 507 specified web site address in their entry. <Table 2> shows the number and proportion of the public libraries observed and identified digital reference service. Digital reference service is used here as a comprehensive term encompassing all question-answering interactions between users and library staffs through internet communication.

Of the 507 libraries visited by the URL, 17 libraries were not accessible at the time of observation. From the 490 libraries accessed, I found that 482 libraries (85.61% of the total public libraries) are offering digital reference services, 8 libraries are

〈Table 2〉 Number and percentage of libraries offering digital reference service

category	2003	2007
	number of libraries (%)	number of libraries (%)
libraries without URL	221 (47.84)	56 (9.95)
libraries offer digital reference	202 (47.84)	482 (85.61)
libraries not accessible	27 (5.84)	17 (3.02)
libraries not offer digital reference	12 (2.60)	8 (1.42)
sub-total	241 (52.16)	507 (90.05)
total	462 (100.00)	563 (100.00)

not. It reveals that digital reference services are prevalent across public libraries in Korea.

Comparing with the data in 2003, it shows a drastic increase, from 43.72% to 85.61%, over 4 years. Public libraries overwhelmingly adopted digital reference services. Of the 482, considerable number of libraries share digital reference site with branches or adjacent libraries. It is a new trend that was not noticed in 2003. In total, there are 404 distinct digital reference sites in public libraries. These 404 sites are the object of the following analysis.

3.1.2 Mode of Question Submission

The next area of observation is the method of question submission. Of the 404 public libraries offering digital reference, 396 sites(98.02%) used public bulletin board system, and only 8 sites used both bulletin board and email. Bulletin board system is the dominant form of digital reference application in

Korea. In 2003, 99% of the digital reference sites used bulletin board system.

This is a very peculiar aspect of digital reference services, compared to other countries, where digital reference services take a variety of modes from email to real time chat system. It has both merits and demerits. Users may get answer without asking question individually because question and answer sets are publicly available through the bulletin. This intrinsic nature of publicity may cause privacy problems. Recently, instant messaging has established as a popular communication among the youth in Korea. However, bulletin board still remains as dominant application for digital reference service.

3.1.3 Access Level of the Digital Reference Services

This examination was made to know the prominence and usability of the service provided. 〈Table 3〉 shows that, of the 404 sites providing digital reference,

〈Table 3〉 Access level of the digital reference link

access level	2003		2007	
	number of libraries (%)		number of libraries (%)	
1 click	41	(20.30)	11	(2.72)
2 click	157	(77.72)	367	(90.84)
2&3 click	1	(.49)	1	(.25)
3 click	3	(1.49)	5	(1.24)
total	202	(100.00)	404	(100.00)

〈Table 4〉 Descriptions used for the digital reference links

description	2003		2007	
	number of libraries (%)		number of libraries (%)	
"free bulletin board"	65	(32.18)	79	(19.56)
"free bulletin board" and "suggestions"	61	(30.20)	71	(17.57)
"bulletin board"	21	(10.39)	15	(3.71)
"Q and A" or "question and answering"	9	(4.46)	40	(9.90)
"free bulletin board" and "Q & A"	5	(2.47)	17	(4.21)
description including "reference"	7	(3.47)	8	(1.98)
"ask" or "ask to librarian"	-		15	(3.71)
others	34	(16.83)	159	(39.36)
total	202	(100.00)	404	(100.00)

11(2.72%) have a direct link (one click) from the library homepage. Majority of the public libraries (367, 90.84%) placed their reference service links on the second level, and 5 (1.24%) on the third level.

Number of the clicks to access is one of the important factor affects users seeking information. Comparing with the 2003 data, there are considerable drawback in access level. At the present, 90.84%

of the digital reference sites passing through upper links. The descriptions of the upper links are, "user ground," "open ground," "participant ground," etc., which do not give hints for question implicitly. Some measures should be undertaken to make the service visible and easily accessible.

3.1.4 Description for the Digital Reference Service

Many different wordings are used to describe the digital reference links. As of 2007, more than 60 different kinds of wording and its combinations are used. <Table 4> shows the various descriptions used for digital reference links. The word in the quotation is an English translation of the original description.

As shown in <Table 4>, descriptions used for digital reference links in 2007 reflect almost same feature with the descriptions used in 2003. The most popular wording is “free bulletin board” (79 of 404, or 19.56%), followed by slightly less “free bulletin board” & “suggestions” (71 of 404, or 17.57%). Other variations includes following : “bulletin board,” “Q & A,” and “question answering.” As can be seen in the <Table 4>, the description reflects the technology of bulletin board system applied. The word “reference” is used in very small portion of descriptions. It is noted that description with “ask” or “ask to librarian” is newly appeared in 2007 data. The proportion of the “question and answering” or “Q & A” is

more than doubled. Only those two descriptions give the point a hint for asking questions. “Others” consist of numerous different wordings including “cyber,” “electronic,” “voice,” “customer services,” etc. Comparing with the 2003 data, descriptions for digital reference links are far more varied and presented inconsistently. It may cause users confusion to select right links to submit questions.

3.1.5 Statement of Service Policy

The libraries state service policy on web form. <Table 5> shows the provision of policy stipulation.

Of the 404 digital reference sites observed, 210(51.98%) have some sort of policy statement. 194 sites do not make any mention of their policies for the service. Observing the percentage increase, only a little change occurred. Lack of policy makes the service administration difficult and it may cause public grievance. <Table 6> shows kinds of policy statements encountered on the web forms.

Note : Percentage is the proportion of the statement shown on web forms of 92(N=92, 2003) and 210(N=210, 2007) respectively ; the percentage do not

<Table 5> Provision of service policy

category	2003	2007
	number (%)	number (%)
sites with policy statement	92 (45.77)	210 (51.98)
sites without policy statement	109 (54.23)	194 (48.02)
total	201 (100.00)	404 (100.00)

〈Table 6〉 Content of the service policy statements

statement	2003	2007
	no. of sites (%)	no. of sites (%)
deletion of inappropriate questions	80 (86.86)	186 (88.57)
eligibility with real name/address	63 (68.48)	140 (66.67)
official answers only for "suggestions"	18 (19.57)	4 (1.90)
refer or guide to use proper links	6 (6.52)	10 (4.76)
protection of personal information	-	5 (2.38)
duration of question posting	3 (3.26)	4 (1.90)
response turnaround time	2 (2.17)	4 (1.90)
unacceptable question(home work, quiz, etc)	-	3 (1.43)
answers only for reference questions	2 (2.17)	1 (0.48)

add up to 100 because some includes more than one statement.

The most popular statement is the deletion of the inappropriate questions. As of 2007, 88.57% of the sites with statement mention this policy. Inappropriate questions include commercial, slandering, antisocial or vulgar presentation. The next one is concerned with the use of real name/address. Digital reference sites declare that they do not respond to the questions from unidentifiable person. Comparing with the 2003 data, there is no indication for improvement. The statements still lack of important elements such as expected turnaround time. Only a few sites mention about protection of personal information(5 sites) or kinds of unacceptable questions(3 sites).

3.1.6 Web Forms and Authentication

Web form interface is typically used to

solicit questions in public libraries. A structured format of web from provides users with convenience for asking questions.

In 2003, most of the public libraries do not restrict their digital reference services to the local community. However, the situation is changed in 2007. Among the 404 digital reference sites observed, 188(46.53%) request user id and password. To observe the web forms, the author applied for membership and then get accessed. In case that community residential evidence is required, the author couldn't apply for membership and gave up observation. Finally, the author accessed to 242 web forms of digital reference sites in 2007.

Libraries are using a simple form with basic information (such as user's name, email address, question title, and question) or a detailed form with more information. In general, basic information is required and detailed information is

〈Table 7〉 Elements of the detailed web forms

element	2003	2007
	no. of libraries (%)	no. of libraries (%)
password	158 (93.49)	213 (88.02)
resident registration number	118 (69.82)	119 (49.17)
homepage	86 (50.89)	15 (6.20)
telephone/celle phone number	48 (28.40)	57 (23.55)
files attachment	–	73 (30.17)
residential address	35 (20.71)	73 (30.17)
text formats	–	32 (13.22)
purpose of the question	11 (6.51)	5 (2.07)
option for open to the public	10 (5.92)	22 (9.09)
reply by email	–	10 (4.13)
others	8 (4.73)	42 (17.36)

〈Table 8〉 Library sites offering FAQ

category	2003	2007
	number of libraries (%)	number of libraries (%)
sites with FAQ	54 (24.75)	198 (49.01)
sites without FAQ	152 (75.25)	206 (50.99)
total	202 (100.00)	404 (100.00)

additional option. 〈Table 7〉 shows the elements of the detailed information.

(Note: Percentage is the proportion of the element shown in detailed web forms of 169(N=169, 2003) and 242(N=242, 2007) respectively; the percentage do not add up to 100 because each web form includes more than one element.)

Password is used for the purpose of deleting the question by the questioner. Some of the elements, such as resident registration number or residential address

are very private information, not much necessary for questioner identification. On the contrary, essential information, such as question purpose is rarely encountered. Text format, file attachment, reply by email are new elements appeared in 2007 data. "Others" include SMS reply, link, upload, register to the bulletin, tag, etc.

3.1.7 FAQ and the Nature of Its Documents

Libraries maintain questions and answer archives to develop FAQ(Frequently Asked Questions) database. And users find answer from FAQ before querying the digital reference services.

As shown in <Table 8>, 198 sites(49.01%) among the 404 libraries offering digital reference, provide FAQ in their homepage in 2007. Comparing with the data collected in 2003, the percentage is almost doubled. However, FAQ is not yet established as a part of the public library homepage.

For the library sites with FAQ, the researcher examined access level. Number of the clicks required to access to FAQ from the homepage is dominantly within 2 clicks via “user ground,” “open ground,” etc. It means that majority of the FAQ are not provided under the digital reference service. The size of the FAQ is small, average of 14.13 questions in 2007 data, and the contents are mainly concerned with library procedures or policies. It is very difficult to find FAQ with pure reference question in its list. It might be a reflection of the kinds of questions that digital reference services currently receiving

from the users. However, some measures should be taken to meet the user’s information need, either dividing FAQ to 2 separate sections, FAQ (user guide) and FARQ (Frequently Asked Reference Questions), or providing referral for library use questions to “user guide.”

3.2 Performance of the Digital Reference Service

Output Measures for Public Libraries (Van House et al. 1987) discusses the computation of two reference-related measures, reference transactions per capita and reference completion rate. Over the last decade measuring and evaluating digital reference services has prompted. Lankes and Kasowits(1998) enumerates wide range of elements ranging total number of transactions to user satisfaction. Recently McClure et al.(2002) suggest 35 elements of digital reference service amenable to evaluation.

In view of the primitive stage of services in Korea, a rather simple approach is taken for this study. As an attempt to assess and have an overview on the performance of the digital reference

<Table 9> Number and percentage of the sites used

category	2003		2007	
	number of libraries (%)		number of libraries (%)	
libraries with posting	156	(78.40)	287	(71.04)
libraries without posting	43	(21.60)	117	(28.96)
total	199	(100.00)	404	(100.00)

services, the author measured four elements; percentage of the sites with question submission, the quantity of the questions, response rate, and types of questions submitted.

3.2.1 Digital Reference Sites with Question Submission

For the 404 digital reference sites accessible, usage data was collected. However, the author could find question and answer posting only from 287 sites. 117 sites (28.96% of the accessible) didn't receive any questions during 15 days from April 11, 2007 to April 25 in 2007. <Table 9> shows the number and percentage of the sites that received questions.

Digital library services is available, but it is not a popular service to the public library users. Public libraries rushed to construct reference sites. As shown

in <Table 2>, 482 public libraries, mounting up to 85.61% of the total public libraries, offer digital reference service. However, Almost 30% of the sites are not used at all during the data collection period. Comparing the percentage of the used sites in 2007 to the 2003 data, there is a big difference(7.36%). Decrease of the site use is an obvious evidence indicating service decline. Though the digital reference sites are not used actively, 389 library sites (96% of the total sites) maintain question and answer database searchable. Most of the digital reference sites are providing keyword search engines.

In the course of transcript recording, the author noticed some kind of gap between libraries by geographic region. An attempt was made to analyze zero posting libraries according to the government administrative division. <Table 10> is the results of the analysis.

<Table 10> shows the number and

<Table 10> Distribution of zero postings libraries by geographic area

geographic area	no. of digital reference sites	no. of sites with zero posting (%)
Seoul	49	4 (8.16)
Incheon & Kyunggi province	78	13 (16.67)
5 big cities	64	18 (28.13)
8 provinces	213	82 (38.50)
total	404	117 (100.00)

<Table 11> Descriptive statistic measures of the site use

category	mean	median	mode	range	total questions submitted
2003	7.50	5	3	42	1,170
2007	5.63	3	1	45	1,617

〈Table 12〉 Distribution of questions received by digital reference sites

number of questions	number of libraries (%)
1-5	194(67.60)
6-10	47(16.37)
11-15	22(7.66)
16-20	14(4.87)
21-25	3(1.05)
26-30	2(0.70)
31-35	2(0.70)
36-46	3(1.05)
total	287(100.00)

percentage of the zero posting reference sites. 5 big cities include Busan, Daegu, Kwangju, Daejon, and Ulsan. It shows a considerable gap between Seoul & metropolitan area and other cities & provinces. Percentage of the zero posting sites are ascending consistently. Here, we can see a symptom of digital divide. Even though Korean government put out efforts to eliminate digital divide for years, there remains huge gap in using internet for information.

3.2.2 Quantity of the Questions Submitted

The author copied the question and answer list for those 287 library sites with question posting, then counted the number to assess the level of service usage. 287 libraries received a total of 1,617 questions during the data collection period. The volume of digital reference use is low. Comparing with the 2003 data,

digital reference use decreased in quantity. 〈Table 11〉 shows the central tendency of the number of questions received by digital reference sites. It is measured only for the reference sites with posting.

In 2007, the mean number of the received questions per digital reference site is 5.63. Comparing the mean to the data of 2003, the usage level is drastically declined. There are big differences between libraries, with minimum of 1 and maximum of 46. Median is 3, and the mode is 1. Mode 1 represents that digital reference sites with only one question is the greatest frequency in the distribution. 〈Table 12〉 shows the distribution more precisely.

As shown in 〈Table 12〉 the distribution is extremely skewed. 194(67.60%) of the 287 sites received 1-5 questions. 47(16.37%) received 6-10 questions. That is, 83.97% of the digital reference sites received questions not exceeding 10. The situation is pessimistic. Digital reference service in public libraries are degenerated

over 4 years.

The decrease is a phenomena against the information environment. People in Korea, either, intellectuals, managers, government officers, or students are regularly use internet for data and information. According to a report by the Koreanclick(2007), the number of internet users visiting major portal sites continuously increased with a rate 16.7% during 2004- 2007 period. It estimates that 99.4% of the internet users in Korea visits portal sites more than once in a month. The performance of the digital reference sites operated by libraries is superior to the portal sites in terms of response and accuracy (Chang and Lee

2006). However, libraries do not attract users. Without users asking question, the digital reference service cannot be sustained.

3.2.3 Response Rate

Given the data collected, rate of response was assessed. The author counted only the reply from the library staffs as response. <Table 13> shows overall response rate for the data 2003 and 2007 respectively. 287 digital reference sites responded to 1,137 of the 1,617 questions in 2007. The response rate is 70.32%. In some cases, a question received more than one response, because the

<Table 13> Response rates for digital reference sites

year	no. of questions submitted	no. of questions responded	response rate(%)
2003	1,170	797	68.12
2007	1,617	1,137	70.32

<Table 14> Types of questions presented to digital reference sites

category	2003	2007
	number (%)	number (%)
library policy, procedure, scope of collection	264 (24.98)	373 (23.07)
reference (directional, ready reference, specific search)	112 (10.60)	104 (6.43)
equipment & facilities	98 (9.27)	108 (6.68)
questions about special programs	46 (4.35)	72 (4.45)
library technology (internet, OPAC, CD, eBook, etc.)	35 (3.31)	143 (8.84)
non- library questions to refer	24 (2.27)	4 (0.25)
non questions (advertisement/publicity, complains etc.)	478 (45.22)	789 (48.79)
questions closed(not open to the public)	-	24 (1.49)
total	1,057 (100.00)	1,617 (100.00)

mode of bulletin board system allows the service users to write a reply.

Comparing with the data of 2003, overall response rate increased a little, from 68.12% to 70.32%. The rate of 70.32% is very similar to the rates reported by the most digital reference services in America. Fiorentine and Shostak(1999) report an average response rate of 74% for the digital reference services affiliated with Virtual Reference Desk(VRD). Janes(2001) reports an average response rate of 70% for the major Ask-a services in America. The average response rate of The Internet Public Library is shown as 70.02% (Internet Public Library 2003). In Korea, the level of digital reference service usage is low, but the response rate is not.

3.2.4 Types of Questions Submitted

For the 1,617 question texts collected, content was analyzed to identify kinds of questions users typically ask. Question analysis provides a good indicator for the service coverage and is useful to know the level of help the users need.

Reference transactions have been categorized in various ways. Katz(2002) devised 4 most widely used category of reference questions ; directional, ready reference, specific search, research. Sears(2001) added a category for library policy and procedural question. Warner(2001) employed a category, skill based questions, i.e. "how to" questions, which could be answered by paraprofessionals.

Users accessed to the digital reference sites and posted a variety of questions. It is not an easy job to categorize questions received. In reference to the literature mentioned above, the author constructed a seven category framework. Each transcript is reviewed and assigned to one of the 7 categories shown in <Table 14>.

Comparing with the data of 2003, the distribution pattern of questions types is almost similar, except for questions on the library technology, jumped from 3.31% to 8.84 % of the total. Questions about library technology come from users having problems in accessing, searching, and using electronic tools and materials. This increase may be caused by the expansion of digital resources in public libraries.

Although the digital reference service might have been intended to answer the reference questions, users do not seem to use for that purpose. The most frequent postings are non questions (789, 48.79%), which do not need answers. Non questions are consist of advertisement/publicity, complaints, suggestions, encouragements, library etiquettes, thanks, etc.

In reference to the data shown in <Table 6>, "deletion of the inappropriate question" is the most prominent policy statement of the digital reference sites. However, libraries do not seem to monitor to eliminate inappropriate questions accordingly. On the other hand, this phenomena represents the intrinsic nature of "bulletin board"

itself, which implies something of community information forum. Considering the huge amount of non questions not eligible, the response rate of the digital reference services must be regarded as higher than the estimation in <Table 13>.

The next frequent category of question is library policy, procedures, scope of collection, comprising 23.07% of the total. Questions about equipment and facilities are concerned with copy machine, parking lot, cafeteria, etc. These are the questions that could be answered by paraprofessional staffs or library guide.

It is disappointing that the percentage of the reference questions is decreased from 10.60 % in 2003 to 6.43% in 2007. Digital reference sites receive small amount of pure reference questions. Comparing with the reference question proportion of 7.9%, shown in the analysis of 29 digital reference services in Kyonggi province(Lee, 2006), the figure is not much surprising. It still represents the chronic problem of the library reference services in Korea.

4. Conclusion

This study attempted to understand the present status and examine the development of digital reference services in public libraries during years 2003–2007. A nationwide data collection was made in 2007 through direct site observation and copying transcript recording. the analysis focused on the offering

characteristics and performance of the services. To examine the development, analyzed data of 2007 was compared with the 2003 data in a previous study. Findings reveal various aspects of the current digital reference services as well as changes occurred over four years. Related problems are identified and lead to insights for the service promotion.

As of 2007, 85.61% of the public libraries in Korea provide digital reference service. From 2003 to 2007, the number of the public libraries offering digital reference service more than doubled. Looking into the offering characteristics, the problems of accessibility, such as access level and link description, are still unsolved while policy stipulation and FAQ provision are slightly improved. However, the most serious problem is concerned with the use of the service.

About 30% of the digital reference sites are not used at all during the data collection period of 15 days. Again, there is a symptom of digital divide by geographic region. The average number of the questions posted per library decreased from 7.5 in 2003 to 5.63 in 2007. The internet penetration rate of Korea is at a very high level and digital reference services are available all over the country, but the general public do not use the service. In addition, received questions are poor in content. According to the question type analysis, the proportion of the pure reference question is lowered.

The present status of the public library digital reference service is in primitive

stage. The service is degenerated both in quantity and in quality. Public libraries should carry out innovative strategies to promote and to be relevant to the public.

As we know, digital reference service is an extension and development of traditional reference service. We should not forget the common problem of the libraries in Korea, lack of real reference service. Most of the residents do not have habits of using reference service in living, work, and study.

Primary reason for nonuse is that people do not know the existence. Increasing public awareness is the most urgent task than others. Thus, to establish digital reference service as a real service, librarians

should take a challenge to cultivate community residents to know it. Thereafter, to attract people to the service and compete with other services, the advantage of digital reference service, e.g. reliable and authoritative information by professional librarians, must be publicized with evidence. As more users coming to the digital reference service, ongoing evaluation to measure user satisfaction is indispensable to continue and enhance the service. Public libraries in Korea should be more active to support digital reference service to provide every user with opportunity to pursue his or her information need.

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